

Creating Equal Opportunities for On-Grid and Off-Grid Electrification in Rural Energy Funds

Village Power 2000: Empowering People and
Transforming Markets

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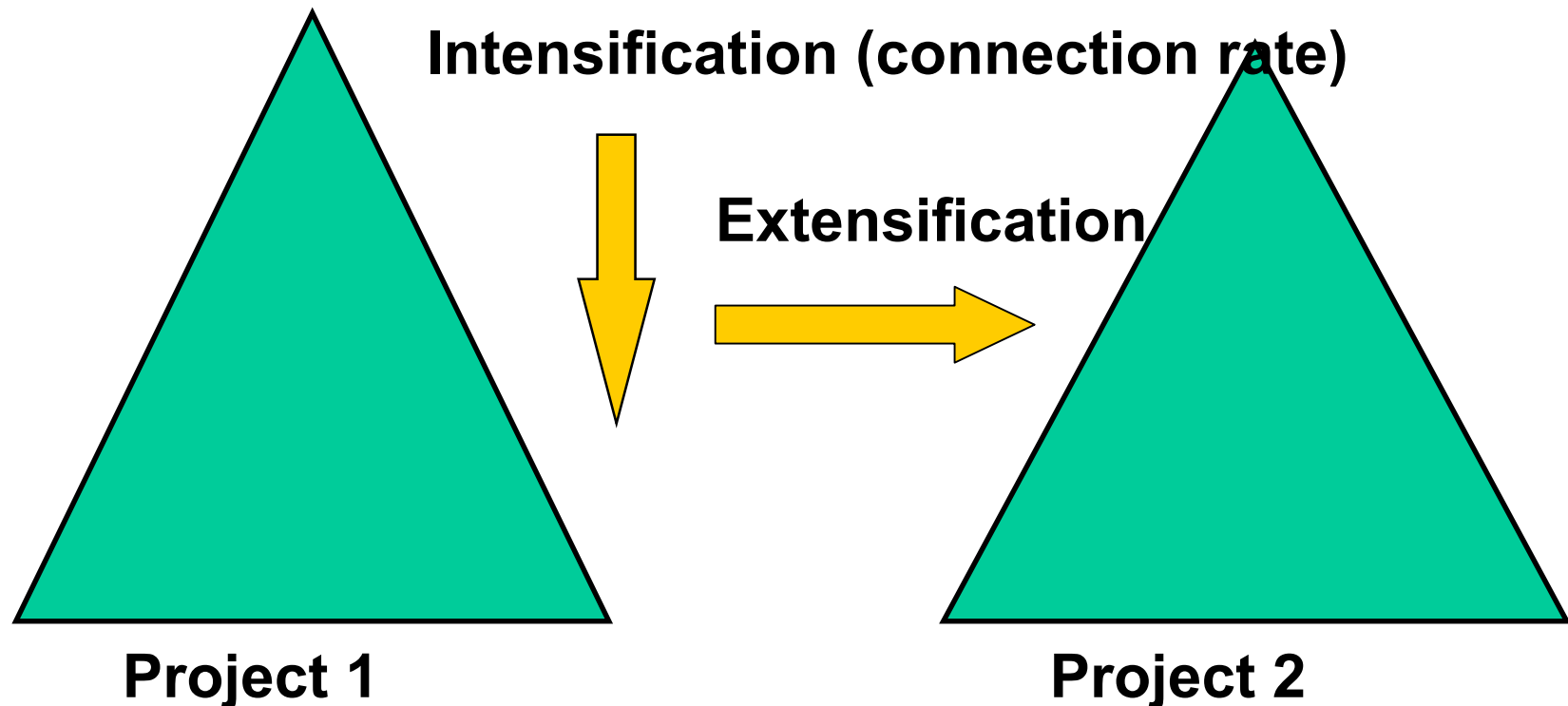
REF PURPOSE (Uganda)

- “In order to make rural electrification *projects commercially viable*
- and *tariffs affordable* for an important number of rural communities,
- the Fund will utilise subsidies to buy down:
 - (i) investment costs, and
 - (ii) risks and information barriers
- to public or private initiatives.”

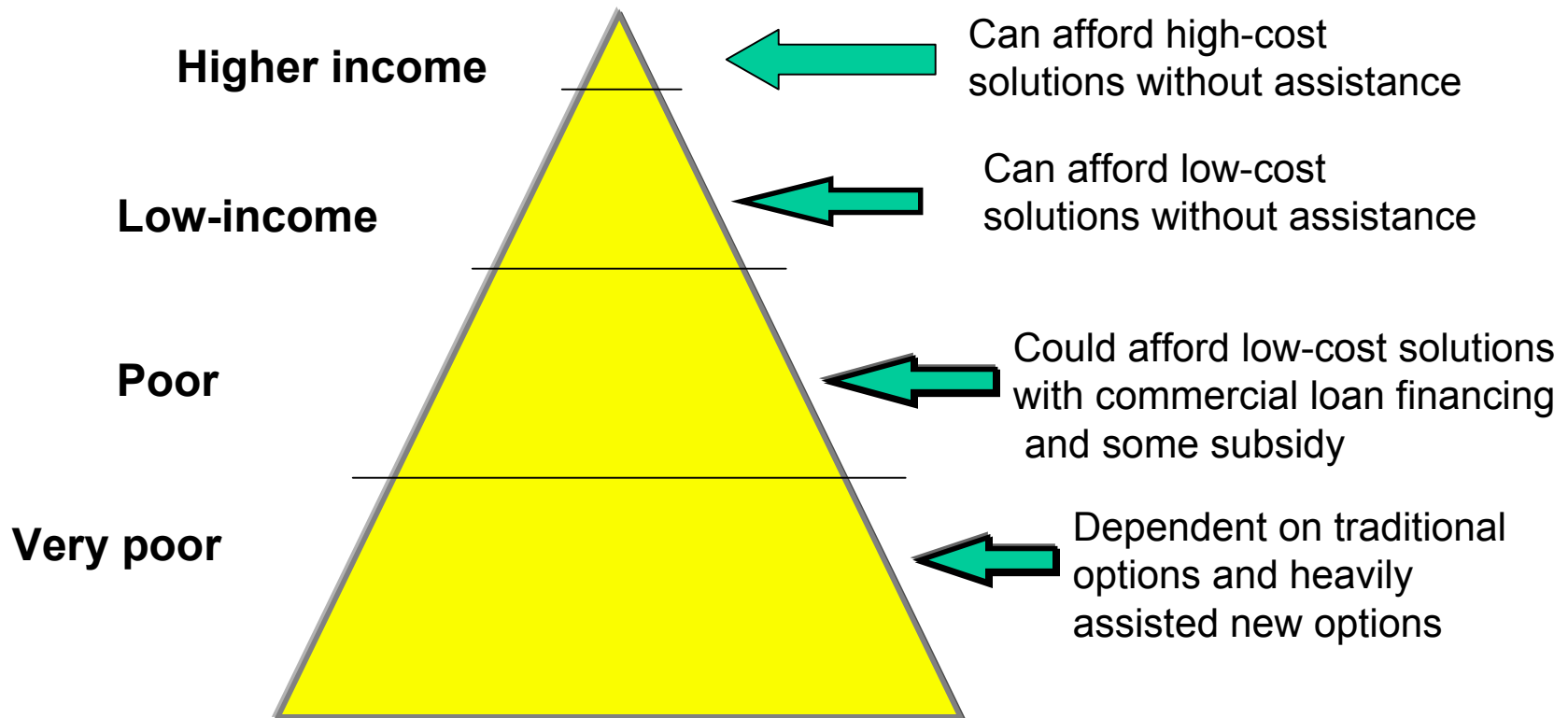
CRITERIA FOR FIXING REF SUBSIDIES

Wrong Question: What is the rural population's ability to pay?

Right Question: How do we increase access?



AFFORDABILITY OF TARIFFS: Who do you refer to?

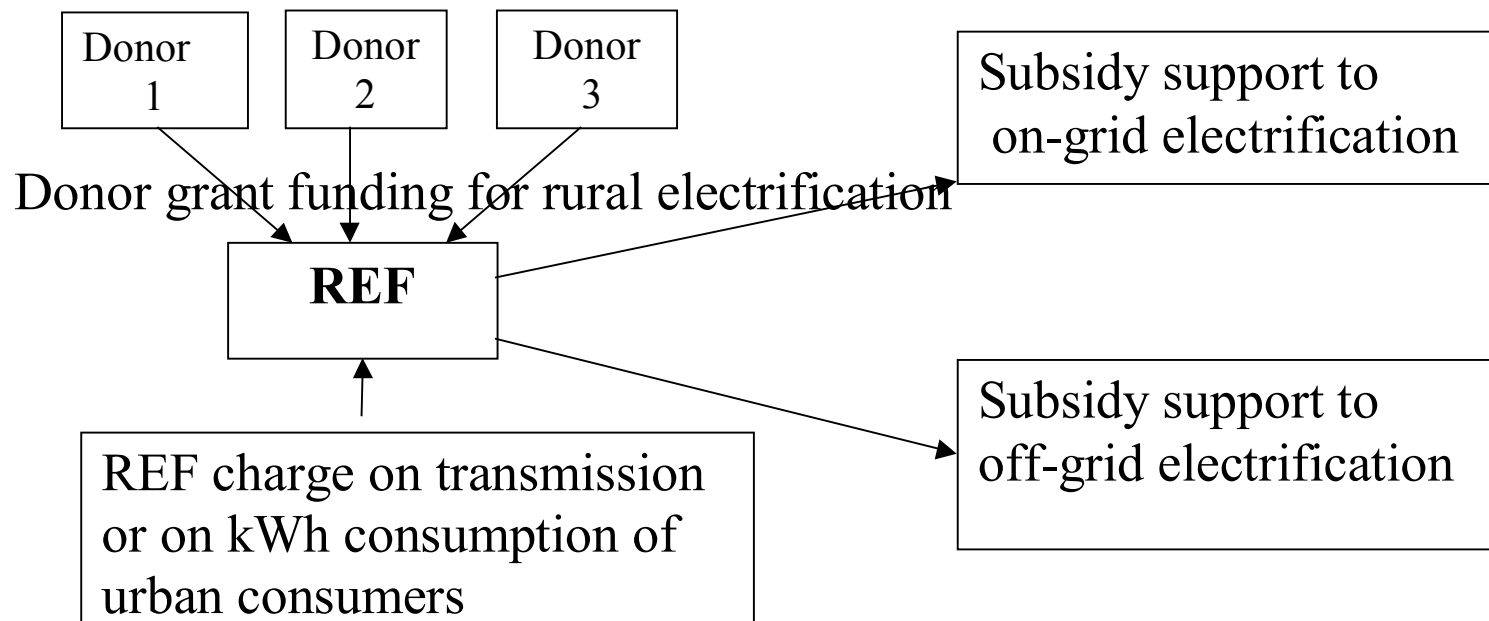


RURAL ENERGY STRATEGY POLICY STATEMENT (Uganda)

- “The **objective** of the RE Fund will be to get **maximum access** per invested subsidy amount subject to the satisfaction of **regional equity** requirements.”
 - “The provision of sustainable electricity supply to a **maximum of new consumers** will be the major determinant for fixing the **criteria** for the award of subsidies to individual projects.
 - Yet, the **criteria** must take **regional equity** considerations into account.”

REF-Objective

Instrument for coordination and long-term commitment of donor assistance



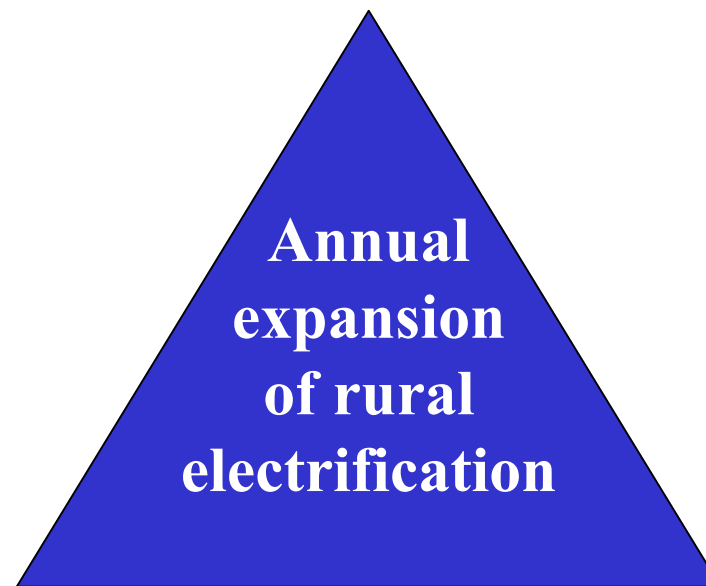
Rationalization of regional cross-subsidies in the power sector

Context for REF Operation: External complementary Reforms

- Elimination of national tariffs: introduction of differentiated tariffs according to local costs of supply
- Rationalization of the system of regional cross-subsidies in the power sector: creation of the REF and carving of rural and urban concessions zones
- Elimination of import duties on SHS & IPVS

Affordability of the National Rural Electrification Program: the three Elements

Consumer affordability (pay tariffs)



**Government affordability
(finance subsidies)**

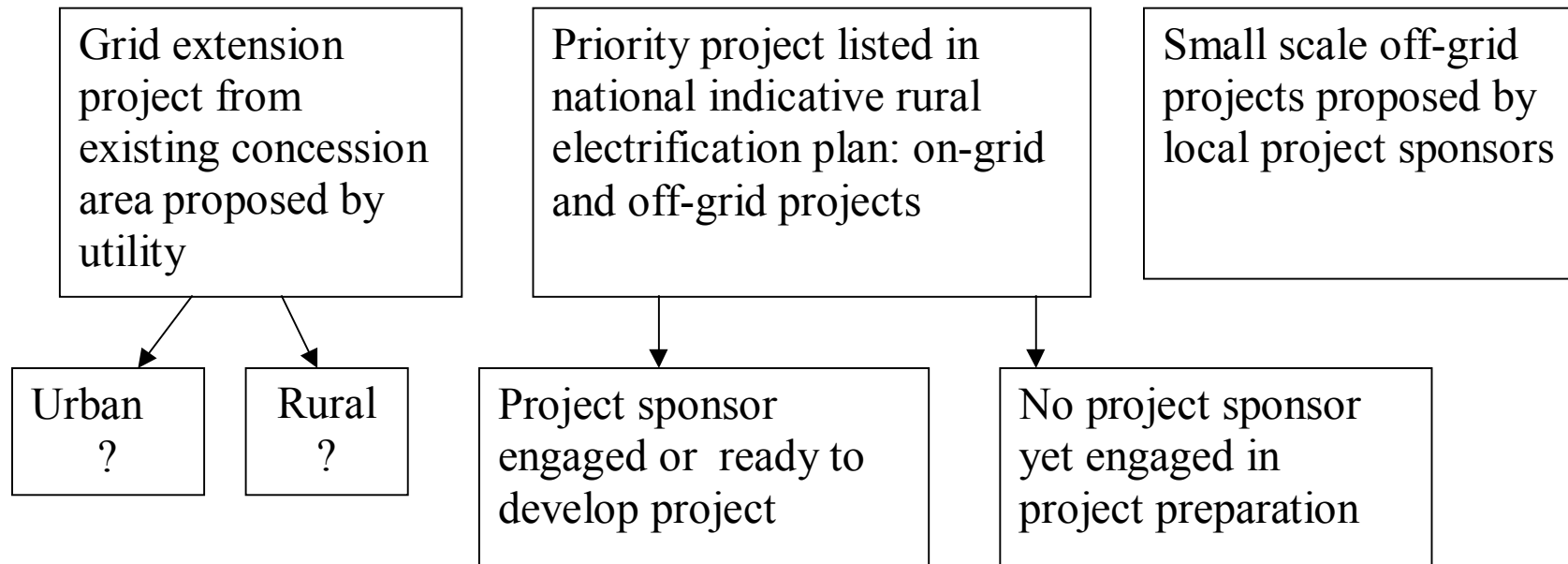
**Sponsor “affordability”
(raise equity + debt)**

Type of Subsidy Support that can be provided through a REF

	Subsidize Inputs	Subsidize Output
Direct subsidy	<ul style="list-style-type: none"> • Feasibility studies of project promoters • Cost of grid and generation investment • Cost of investment in consumer connections • Loan guarantee schemes • SHS or IPVS 	<ul style="list-style-type: none"> • Specific “ability to pay” based tariffs in project areas • National lifeline tariffs
Indirect subsidy	<ul style="list-style-type: none"> • Indicative rural electrification plans • Detailed preparation of concession areas for bidding • Community awareness campaigns • TA to create competitive supply in rural power construction and consulting • TA to community and NGO schemes 	<ul style="list-style-type: none"> • (Coupons for purchase of electricity provided to low income consumers)¹⁾ • (Payment of public lighting by state budget)¹⁾

1) Would normally be provided not by REF but by state or local government budgets.

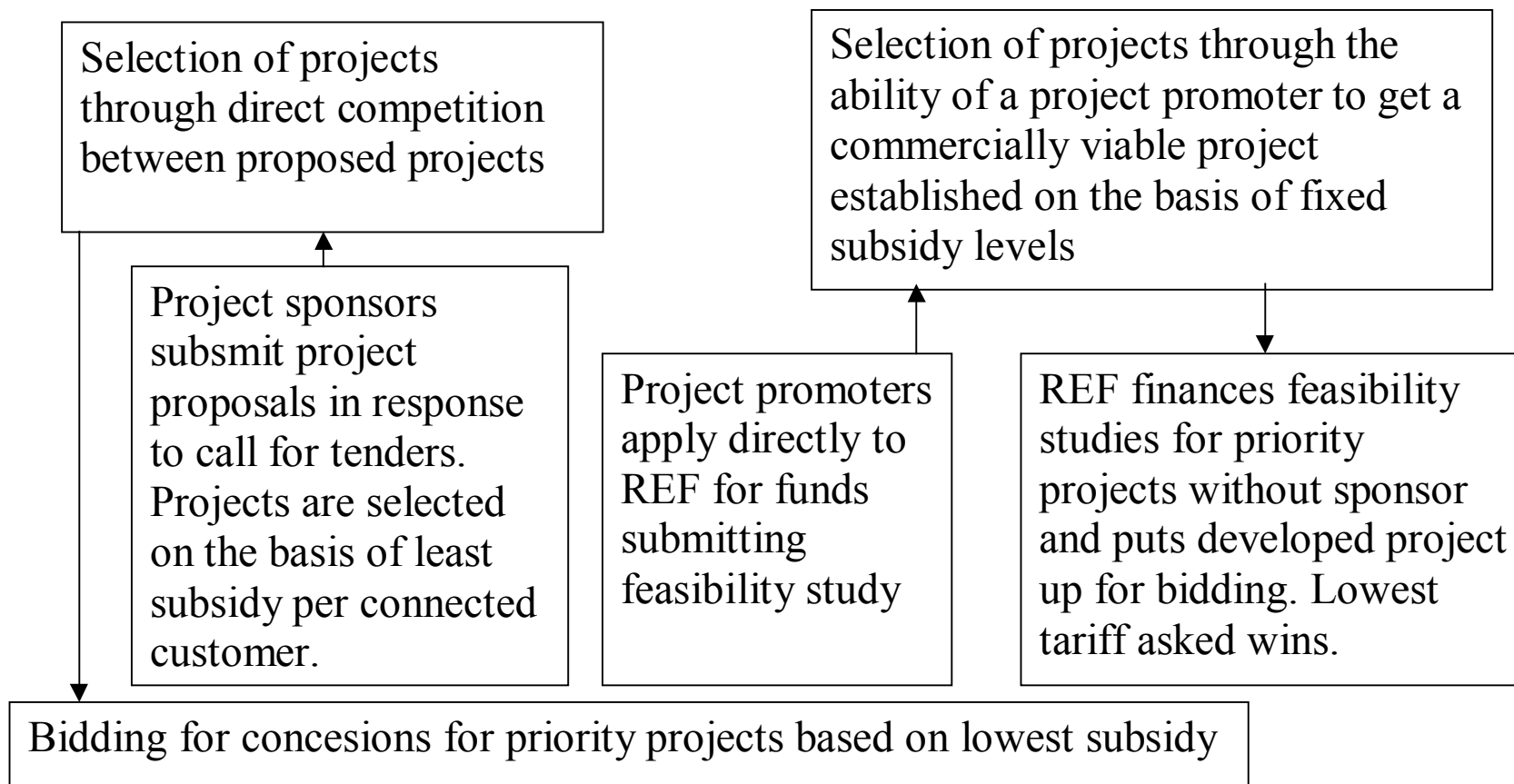
Projects faced by REF for which Policies must be defined



Mechanism for Project Selection and Channeling of Subsidies

Direct competition

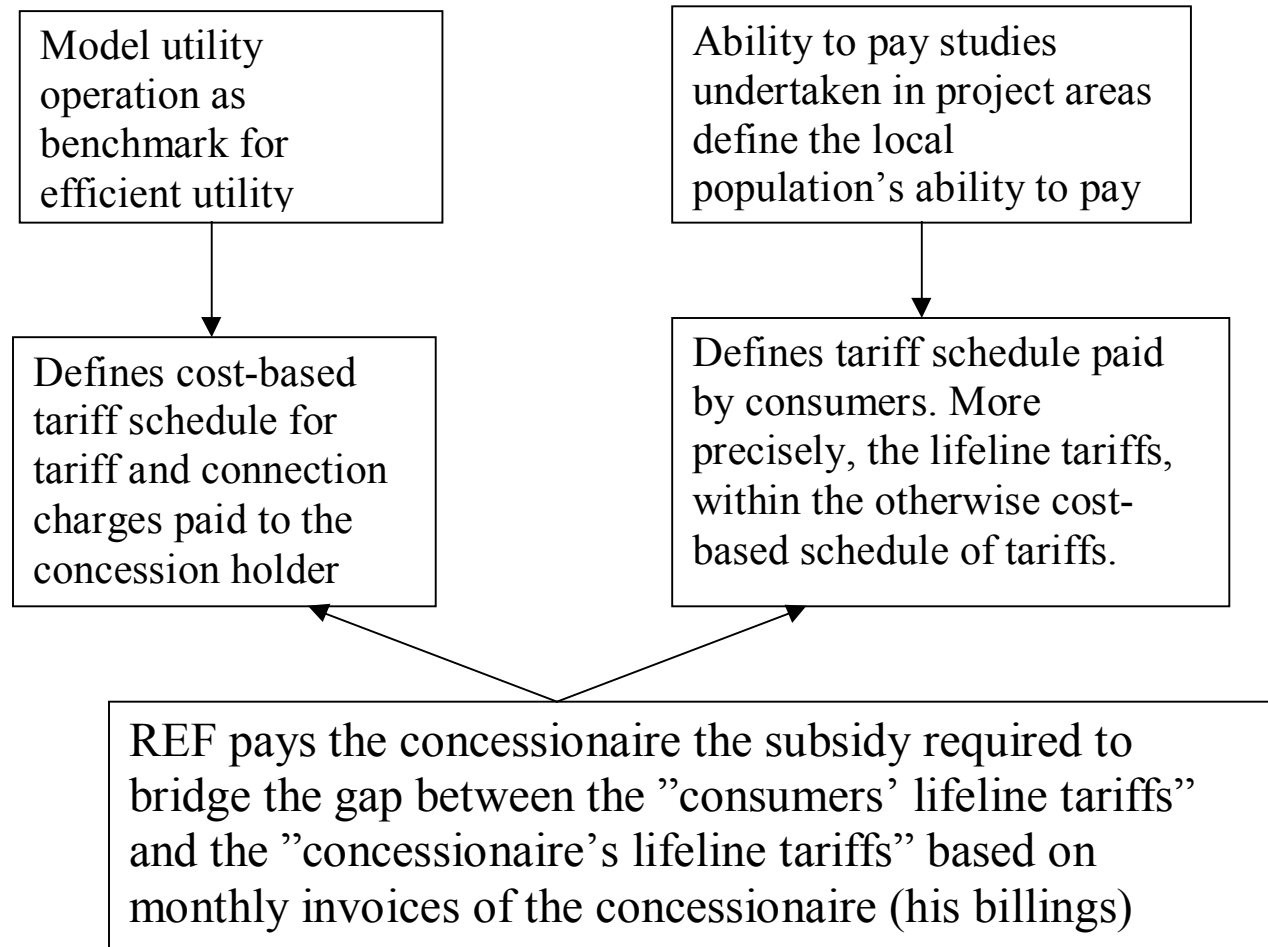
Indirect competition between projects



Two Basic Schools of Thought

- *bottom-up entrepreneurial school of thought:*
“let 1000 ideas and initiatives flourish”.
- *top-down concession school of thought:*
“reduce transaction costs and
professionalize by bringing in ESCOs”

Argentinean Concession for Off-Grid Operations



“Concessionaire’s lifeline tariffs” 1999-2000, Argentina

	\$/month fixed charge	\$/kWh variable tariff
SHS	22	1.14
Grid, 8 hours operation	38	0.27
Grid, 18 hours operation	36	0.21
Grid, 24 hours operation	41	0.21
Connection charge	\$ 56	

Ability to Pay the Argentina Model

Argentina (GNP \$5000?)

Household ability to pay
(monthly expenditure on
electricity substitutes):

- lower income rural
consumers (<\$1800/year)
\$10/month for 4 kWh

Scope of Electrification:

- only 6% of national
population not electrified

Annual Electrification Fund:

- \$350 million from

Philippines (GNP \$1120)

Household ability to pay:
(monthly expenditure on
electricity substitutes):

- average household: \$4.3
- candles: P19/month; kerosene
(96%): P51/month; dry cell battery
(62%): P55/month; charging
battery (13%). P47/month
- electricity (6%): P125/month

Scope of Electrification:

- 36% not electrified

Available annual REF: ???

Ability to Pay - Strategy Consequences

ARGENTINA

Selection criteria:

- least subsidy per connected low income household (margin on top of lifeline T)

Type of subsidy:

- operating subsidies
- + low income household direct subsidy support

Minimum level of service:

- to cover at least basic lighting + TV
=> solar home PV-S from 50Wp and upwards

Bidding / licensing model:

- “Concession” monopoly for subsidy

PHILIPPINES

Selection criteria:

- lowest average tariff (least subsidy per household getting indirect access)

Type of subsidy:

- Project preparation
- Investment subsidy

Minimum level of service:

- to cover basic need for lighting in households => SHS from 50Wp and downwards

Bidding / licensing model:

- dealer or RESCO model

Combine Macro and Micro

Top-down concession approach “Argentina”

- **Pro:**
 - speed
 - lower transaction costs
 - sustainability of O&M
 - ensures electrification
 - private finance (addition)
- **Cons:**
 - need of regulation
 - connection targets
 - priority setting (who comes first?)

Bottom-up LGU/NGO approach

- **Pro:**
 - integration with other local development priorities
 - parties exist
- **Cons:**
 - undercutting due to non-standardised approaches to consumer payments
 - replicability in doubt
 - politization / be gooders
 - weak institutional sustainability

RE-Fund Operation

Common: Approach to fix subsidy levels

Planned projects for concession or contract

- Selection according to objective needs criteria + adequacy for concession
- + commitment of Province / LGUs to finance complementary livelihood projects

Bottom-up project requests for funding

- Eligibility: financial & institutional sustainability
- + integration with livelihood projects?

Transaction Costs - Implications

- Very little competition from project developers to develop isolated grid projects on a spontaneous project basis
- Strong role of LGU in local physical / rural energy planning to identify least cost solutions and project opportunities
- Need for project planning and development coming from below

Options for channelling Funds

- You *organise periodic bidding rounds during the year on a regional* basis with specific funds allocated to specific regions inviting project promoters to submit project proposals. You select among received projects until the available funds are exhausted
- You *publish at the beginning of the year the subsidy rates that RE investment projects are entitled to and eligibility criteria*; regional equity can be handled by providing higher subsidy rates to projects in under-served regions. Project promoters apply throughout the year, and get their requests approved if they comply with eligibility criteria. If funds are exhausted before the end of the year late project proposals must wait till next year

Entrepreneurial Model: Subsidy

- Fix objective rates per investment category once per year (e.g. \$per km of line, per diesel generator category, per kW installed micro-hydro capacity, per PV-system) and publish these
- promoters can apply during year
- subsidies to SHS-systems small and time limited with declining rates over time
- high and prolonged subsidies for communal systems
- high (contingent) subsidies for project preparation
- provide for TA for many years to operators

Eligibility Criteria

- Institutional viability (legal entity is created to own and operate the power system, management. O&M and TA contracts)
- Technical quality of proposed investment (review of feasibility study)
- Use of least-cost design
- Viability of project finance (financing structure: equity contribution and secured loans; provision for working capital)
- Financial viability (the average tariff covers the after-subsidy cost of operation)
- The project is a *rural* electrification project

PV- SYSTEMS

- Solar Home Systems (SHS) are individual consumer products that have no long term infrastructure value and their productive use application is very insignificant
- Institutional PV-systems (public lighting, use in health clinics, schools, community buildings) provide “productive use” benefits to the larger community (indirect access)
- Subsidies to SHS have strong “free rider” effects that increase rapidly with increase in subsidies
- Subsidies to SHS have a role to kick-start the national market and thereby allow a nation-wide marketing and after-sales service infrastructure to be created

Marginal Subsidy Cost Curve for 35 Wp SHS

Assumed elasticity of demand = minus 1					
Subsidy per SHS in FCFA:	0	40,000	60,000	80,000	100,000
Subsidy in percent of installed cost:		12%	18%	24%	29%
Sales price of SHS, FCFA	340,000	300,000	280,000	260,000	240,000
SHS units sold per year	6,000	6,706	7,059	7,412	7,765
Increase in sold SHS compared with zero subsidy	0	706	1,059	1,412	1,765
Stepwise marginal increase in number of sold SHS		706	353	353	353
Total annual subsidy expenditures Mill. FCFA	0	268 mill.	424 mill.	593 mill.	776 mill.
Annual subsidies divided by added customers, FCFA		380,000	400,000	420,000	440,000
Cost of subsidy per marginal customer, FCFA		380,000	440,000	480,000	520,000